CLAIM AMENDMENTS

1. (currently amended) A method of processing signals, comprising:

receiving first, ~~and~~ second, and third signals each being modulated on a carrier signal, the first signal preceding the second signal in time and the second signal preceding the third signal in time;

multiplying each of the first and second signals with a reference signal having a reference frequency;

Viterbi decoding the multiplied first signal based on the multiplied first and multiplied second signals;

comparing the Viterbi decoded first signal to the multiplied first signal;

adjusting the reference frequency as a function of the comparison;

multiplying the third signal with the reference signal now having the adjusted reference frequency;

Viterbi decoding the multiplied third signal; and

turbo decoding the Viterbi decoded, multiplied third signal; ~~and~~

~~turbo decoding a signal with adjusted frequency~~.

2. (original) The method of claim 1 wherein the first and second signals each comprises turbo encoded data.

3. (previously presented)The method of claim 1 wherein the multiplied first and multiplied second signals each comprises a baseband signal.

4. (canceled)

5. (previously presented)The method of claim 1 wherein the comparison of the Viterbi decoded first signal with the multiplied first signal comprises detecting a phase difference between the Viterbi decoded first signal and the multiplied first signal.

6. (previously presented) The method of claim 5 wherein the adjustment of the reference frequency comprises tuning a voltage controlled oscillator as a function of

the phase difference between the Viterbi decoded first signal and the multiplied first signal.

7. (original) The method of claim 1 wherein the adjustment of the reference frequency comprises adjusting the reference frequency to be substantially equal to a frequency of the carrier signal.

8. (previously presented)The method of claim 1 wherein the first and second received signals each comprises a symbol representing a constellation point, and wherein the Viterbi decoding of the multiplied first signal comprises quantizing the multiplied first signal to its nearest constellation point as a function of the multiplied first and multiplied second signals.

9. (currently amended) The method of claim 1 further comprising receiving a fourth ~~third~~ signal between the first and second signals, wherein the Viterbi decoding of the multiplied first signal is not based on the received fourth ~~third~~ signal.

10. (original) The method of claim 1 further comprising transmitting signals including the first and second signals, wherein the receiving of the first and second signals comprises receiving the transmitted signals.

11. (original) The method of claim 10 wherein the transmission of the signals comprises turbo encoding the signals before transmission.

12. (previously presented)The method of claim 11 wherein the transmission of the signals comprises interleaving and de-interleaving of the turbo encoded signals before transmission.

13. (currently amended) The method of claim 11 wherein the transmission of the signals comprises transmitting a fourth ~~third~~ signal between the first and second signals, a first portion of the signals including the first and second signals being turbo

encoded, and a second portion of the signals including the fourth ~~third~~ signal being turbo encoded and interleaved.

14. (currently amended) The method of claim 13 further comprising receiving the transmitted currently amended signal between the first and second signals, wherein the Viterbi decoding of the multiplied first signal is not based on the received currently amended signal.

15. (currently amended) A receiver, comprising:

an oscillator having a reference signal output with a tunable reference frequency;

a multiplier that is operable to multiply a first signal with the reference signal, and to multiply a second signal, succeeding the first signal in time, with the reference signal, the first and second signals each being modulated on a carrier frequency;

a Viterbi decoder that is operable to decode ~~to adjust~~ the multiplied first signal based on the multiplied first and multiplied second signals; ~~and~~

a detector that is operable to compare the ~~adjusted first~~ Viterbi decoded, multiplied first signal with the multiplied first signal, the detector being adapted to tune the reference frequency as a function of the comparison; and

a turbo decoder that is operable to decode the Viterbi decoded, multiplied first signal.

16. (original) The receiver of claim 15 wherein the oscillator comprises a voltage controlled oscillator.

17. (canceled)

18. (previously presented)The receiver of claim 15 wherein the Viterbi decoder comprises a zero trace back Viterbi decoder.

19. (currently amended) The receiver of claim 15 wherein the detector comprises a phase detector to compare a phase of the ~~adjusted~~ Viterbi decoded,

multiplied first signal with a phase of the multiplied first signal, the phase detector being adapted to tune the reference frequency as a function of a difference in phases.

20. (previously amended) The receiver of claim 15 further comprising a switch to prevent a third signal, between the first and second signals, from being adjusted by the Viterbi decoder.

21. (currently amended) A receiver, comprising:

an oscillator having a tuning input;

a multiplier having a first input to receive a signal, and a second input coupled to the oscillator, the signal comprising a first signal and a second signal succeeding the first signal in time, the first and second signals each being modulated on a carrier frequency;

a Viterbi decoder having an input coupled to the multiplier, and an output; ~~and~~

a detector having a first input coupled to the Viterbi decoder input, a second input coupled to the Viterbi decoder output, and an output coupled to the tuning input of the oscillator; and

a turbo decoder having an input coupled to the Viterbi decoder output.

22. (original) The receiver of claim 21 wherein the oscillator comprises a voltage controlled oscillator.

23. (canceled)

24. (previously presented)The receiver of claim 21 wherein the Viterbi decoder comprises a zero trace back Viterbi decoder.

25. (original) The receiver of claim 21 wherein the detector comprises a phase detector.

26. (previously presented)The receiver of claim 21 further comprising a switch between the multiplier and the Viterbi decoder input.

27. (currently amended) A receiver, comprising:

oscillator means for generating a reference signal having a tunable reference frequency;

multiplier means for multiplying a first signal with the reference signal, and multiplying a second signal, succeeding the first signal in time, with the reference signal, the first and second signals each being modulated on a carrier frequency;

Viterbi decoder means for decoding ~~for adjusting~~ the multiplied first signal based on the multiplied first and multiplied second signals; ~~and~~

detector means for comparing the ~~adjusted first~~ Viterbi decoded, multiplied first signal with the multiplied first signal, the detector means comprises tuning means for tuning the reference frequency as a function of the comparison; and

turbo decoder means for decoding the Viterbi decoded, multiplied first signal.

28. (original) The receiver of claim 27 wherein the oscillator means comprises a voltage controlled oscillator.

29. (canceled)

30. (currently amended) The receiver of claim 27 wherein the Viterbi decoder means comprises a zero trace back Viterbi decoder.

31. (currently amended) The receiver of claim 27 wherein the detector means comprises means for comparing a phase of the adjusted Viterbi decoded, multiplied first signal with a phase of the multiplied first signal, the tuning means being adapted to tune the reference frequency as a function of a difference in phases.

32. (previously presented)The receiver of claim 27 further comprising a switch between the multiplying means and the Viterbi decoder means.

33. (currently amended) A method of processing signals having a first and second symbol each representing a constellation point, the first symbol preceding the second symbol in time, the method comprising:

Viterbi decoding the first symbol to its nearest constellation point as a function of the first and second signals;

comparing the first symbol to the Viterbi decoded first symbol; ~~and~~

adjusting a reference frequency as a function of the comparison; and

turbo decoding the Viterbi decoded first symbol.

34. (previously presented)The method of claim 33 further comprising receiving the first and second symbols before the first symbol is Viterbi decoded.

35. (original) The method of claim 34 further comprising transmitting the signals including the first and second symbols, wherein the receiving of the first and second symbols comprises receiving the transmitted signals.

36. (original) The method of claim 35 wherein the transmission of the signals comprises turbo encoding the first and second symbols before transmission.

37. (original) The method of claim 36 wherein the transmission of the signals comprises interleaving and de-interleaving the turbo encoded signals before transmission.

38. (previously amended) The method of claim 35 wherein the transmission of the signals comprises transmitting a third symbol between the first and second symbols, a first portion of the transmitted signals including the first and second symbols being turbo encoded, and a second portion of the signals including the third signal being turbo encoded and interleaved.

39. (previously amended) The method of claim 38 further comprising receiving the transmitted third symbol between the first and second symbols, wherein the adjustment of the multiplied first signal is not based on the received third symbol.

40. (original) The method of claim 34 wherein the received first and second symbols are each modulated on a carrier frequency, the method further comprising multiplying each of the first and second symbols with a reference signal having the reference frequency.

41. (original) The method of claim 40 wherein the multiplication of the first and second modulated symbols each comprises recovering the respective symbol by removing the respective carrier frequency.

42. (original) The method of claim 33 wherein the first and second symbols each comprises turbo encoded data.

43. (canceled)

44. (previously presented)The method of claim 33 wherein the comparison of the first symbol with the quantized first symbol comprises detecting a phase difference between the first symbol and the Viterbi decoded first symbol.

45. (previously presented)The method of claim 33 wherein the adjustment of the reference frequency comprises tuning a voltage controlled oscillator as a function of the phase difference between the first symbol and the Viterbi decoded first symbol.

46. (previously presented)The method of claim 33 further comprising receiving a third symbol, wherein the Viterbi decoding of the first signal is not based on the received third signal.

47. (currently amended) A receiver to receive a signal including first and second symbols each representing a constellation point, the first symbol preceding the second symbol in time, the receiver comprising:

a Viterbi decoder to quantize the first symbol as a function of the first and second symbols;

a detector to compare the first symbol to the quantized first symbol; ~~and~~

an oscillator having a tunable output as a function of the comparison; and

a turbo decoder that is operable to decode the quantized first symbol generated by the Viterbi decoder.

48. (original) The receiver of claim 47 wherein the first and second symbols are each modulated on a carrier frequency, the receiver further comprising a multiplier to multiply each of the first and second symbols with the oscillator output to recover its respective symbol by removing its respective carrier frequency.

49. (canceled)

50. (original) The receiver of claim 47 wherein the detector comprises a phase detector to detect a phase difference between the first symbol and the quantized first symbol.

51. (original) The receiver of claim 47 wherein the oscillator comprises a voltage controlled oscillator.

52. (previously presented) The receiver of claim 47 further comprising a switch positioned in front of the Viterbi decoder.

53. (previously amended) A communications system, comprising:

a transmitter to transmit a signal including first and second symbols each representing a constellation point, the first symbol preceding the second symbol in time; and

a receiver including a Viterbi decoder to quantize the first symbol as a function of the first and second symbols, a detector to compare the first symbol to the quantized first symbol, ~~and~~ an oscillator having a tunable output as a function of the comparison, and a turbo decoder that is operable to decode the quantized first symbol generated by the Viterbi decoder.

54. (original) The communications system of claim 53 wherein the transmitter modulates the first and second symbols on a carrier frequency, and the receiver further comprises a multiplier to multiply each of the first and second symbols with the oscillator output to recover its respective symbol by removing its respective carrier frequency.

55. (canceled)

56. (original) The communications system of claim 54 wherein the detector comprises a phase detector to detect a phase difference between the first symbol and the quantized first symbol.

57. (original) The communications system of claim 54 wherein the oscillator comprises a voltage controlled oscillator.

58. (original) The communications system of claim 54 wherein the transmitter further comprises a turbo encoder to turbo encode the signals before transmission to the receiver.

59. (previously amended) The communications system of claim 58 wherein the turbo encoder comprises a trellis encoder to encode a first portion of the signals including the first and second symbols, and an interleaver coupled to a trellis encoder to process a second portion of the signal.

60. (previously presented) The communications system of claim 59 wherein the receiver further comprises a switch positioned before the Viterbi decoder to pass only the first portion of the signal to the Viterbi decoder.

61. (original) The communications system of claim 58 wherein the turbo encoder comprises an interleaver, de-interleaver, and trellis encoder coupled in series to turbo encode the signals before transmission to the receiver.